Washington Transportation Plan 2005 Update

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Transportation Planning Manager

Peer Exchange: State Transportation Long-Range Plans
Lansing, Michigan
June 14, 2005

Washington State Department of Transportation

What are the Legal Requirements?

Federal Surface Transportation Act (TEA-21)

- Each state must prepare a transportation plan and program providing for development, management, and operation of systems and facilities considering all modes of transportation.
- Plan must be based on at least a 20-year forecast period and may include a financial plan.
- The plan shall be continually evaluated and periodically updated as appropriate.

Section 135 of title 23 of the U.S. Code

State Law

- WSDOT must prepare a “comprehensive and balanced statewide transportation plan” every two years based on legislative policies and applicable state and federal laws.

RCW 47.01.071

- The Commission must develop a state transportation policy plan that establishes a vision and goals for the transportation system consistent with the state's growth management goals; identifies significant transportation policy issues; and recommends statewide transportation policies to the Legislature.

RCW 47.06.030

What are the Stipulated Goals of the Plan? How Clear is the Overall Guidance?

Federal Planning Factors (23USC135)	**State Planning Emphasis Areas** (RCW 47.06)	**Required Modal Plans** (RCW 47.06)
▪ Support the economic vitality of the United States, the States, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency. ▪ Increase the safety and security of the transportation system for motorized and non-motorized users. ▪ Increase the accessibility and mobility options available to people and for freight. ▪ Protect and enhance the environment, promote energy conservation, and improve quality of life. ▪ Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight. ▪ Promote efficient system management and operation. ▪ Emphasize the preservation of the existing transportation system.	▪ Relief of congestion. ▪ Preservation of existing investments. ▪ Preservation of downtowns. ▪ Ability to attract or accommodate planned population and employment growth. ▪ Improvement of traveler safety. ▪ Efficient movement of freight and goods. ▪ Improvement and integration of all transportation modes to create a seamless intermodal transportation system for people and goods.	<u>State-owned</u> ▪ Highways ▪ Ferries <u>State Interest</u> ▪ Aviation ▪ Public Transportation ▪ Freight Rail ▪ Intercity Passenger Rail ▪ Bicycle & Pedestrian ▪ Marine Ports & Navigation

Base Chronology of Transportation Planning Efforts in Washington State

	Transportation Planning Environment	Example Documents & Plans
1960's	Interstate Era: Highway and Transit Expansion Plan	1964 Puget Sound Regional Transportation Plan
1970's	Freeway Revolt: • Removal of cross sound bridges from plan • Removed freeways from Central Puget Sound • Transit in Central Puget Sound voted down	1975 Puget Sound Regional Transportation plan
1977	State DOT and Transportation Commission created and state transportation plan required.	1980 State Transportation Plan, with 1981 and 1982 Updates
Mid 80's	Financial Bust: WSDOT eliminated planning – "maintain only" operation with a pessimistic view on revenue.	No Plan
1987	Commission and WSDOT restart planning – Strategic Issues and Policy	1989 to 1993 State Transportation Policy Plans
1993	WSDOT begins system planning – First highway system plan published	1993 State Highway Systems Plan
1995	First Multimodal Plan published - Each mode in its own silo	1995 Washington's Transportation Plan
2001	Mulitmodal Approach: • Multimodal goals and objectives • Focused on objectives, not modes • No financial constraints	2001 Washington's Transportation Plan

Aspiration for the 2005 Plan Update

- Data driven, analytically grounded and organized by major issue areas.
- Program and investment proposals advanced for the state for each major issue area.
- Investment and programs proposals prioritized into high, medium, and low priority categories.
- Scale of proposed investment constrained by financial realities.

What we're hearing…

"The WTP should be a collection of information and data from which decision makers can make choices."

"DOT's analytic capability must be strengthened so that we have better information on which to take the long view…The key word everyone has to keep in mind is prioritization…"

"We must prioritize and make choices. The debate is not about how to keep doing just about what we are already doing. It's about how to choose to spend the money we have on what we really want."

How is the Process Taking Shape?

Phase 1: Data and Approach Development

- Secretary of Transportation declared the update of the plan the top priority of the agency.
- Build statewide transportation “data library”.
- Analyze statewide trends and system conditions.
- Identify key issues and choices.
- Share the learning and analysis with others.

Phase 2: Developing the Plan Update

- Commission guides tentative judgments on scale and direction of investment programs.
- WSDOT works with RTPOs and others to develop proposals for investment plans and funding scenarios.
- Commission matches priorities to funding scenarios
- Commission adopts the plan.

What is the Outreach Program?

MPO/RTPO Outreach

- Briefing by Secretary MacDonald and Chief of Staff Hammond at quarterly meetings with all MPOs and RTPOs
- WSDOT Modal Directors one on one meetings with each RTPO
- WSDOT WTP briefings at RTPO policy or technical committees by WSDOT HQ and regional staff
- Joint process for developing investment plan
- Freight summits with RTPOs and others
- Legislature funded RTPO participation

Document and Information Sharing

- The WTP web page
- Creating web based documents accessible by everyone
- Creating an on-line data library to share WTP data
- Publishing and distributing folios describing WTP progress
- Email listserv for quick, short messages and links to detailed information

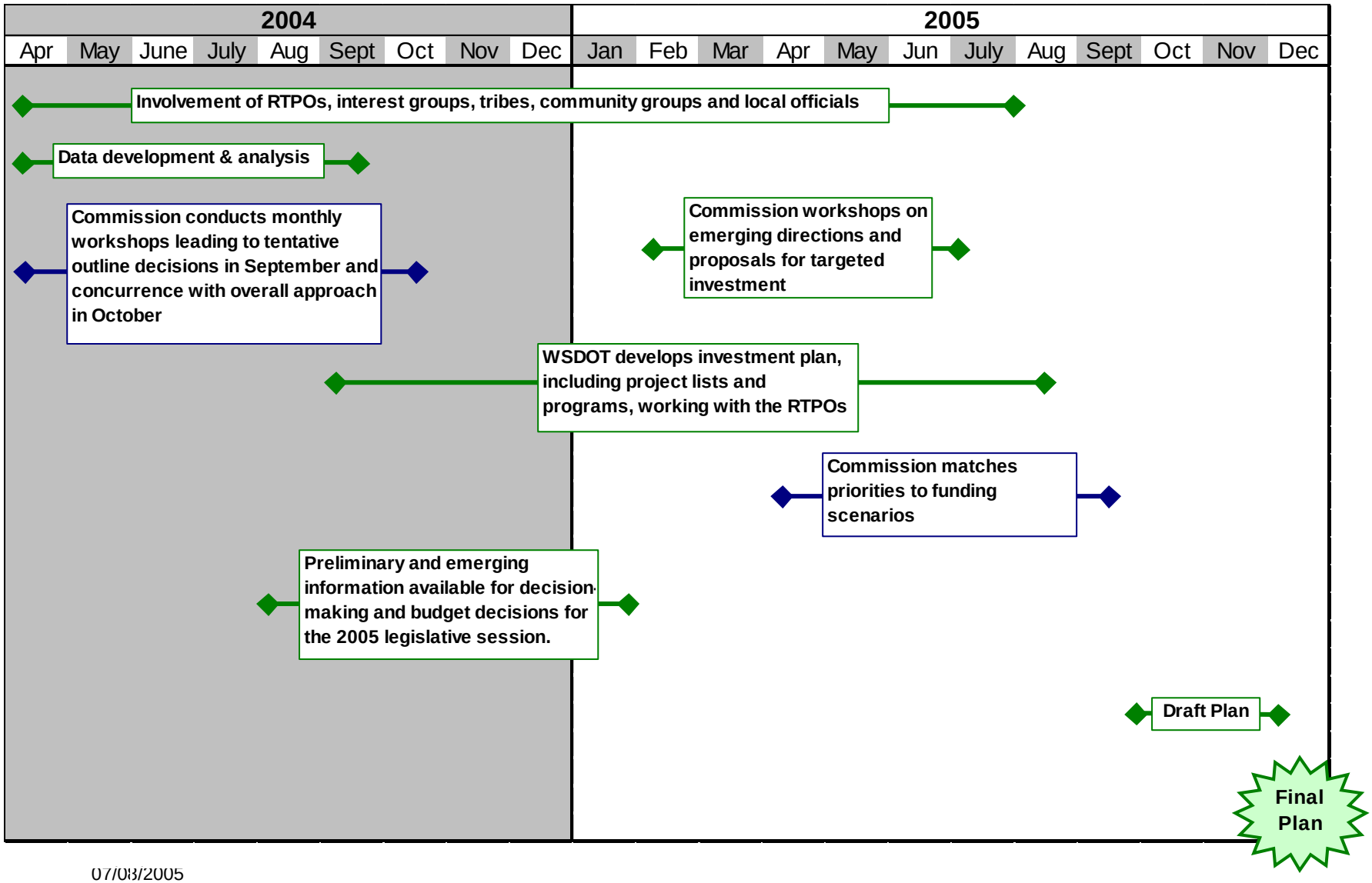
Special Outreach Meetings

- Legislator and legislative committee staff conversations
- Tribal Transportation Planning Organization with federal demonstration and state funding
- Local agency and Transit working groups
- Safety Conscious Planning Workshop
- Freight Customer Interviews
- Freight Workshops with FMSIB
- Congestion Relief Study in Puget Sound, Vancouver and Spokane (TMAs)

Commission meetings

- October 2004 Milestone Event for Sharing Data & Analysis
- Opportunity to share what we've learned, to discuss approaches, and solicit views
- In-depth workshops on each issue's analysis, trends, emerging directions and proposals, and now prioritizing

What's the Schedule?



WTP Data Library

A centralized body of information and resources that can support decision-making.

Four categories of information:

- Population
- Economy
- Transportation Facilities and Systems
- Use of Transportation Facilities and Systems

- New category in development: Costs of providing a transportation system

A few sample pages follow…

The WTP Homepage and the Data Library

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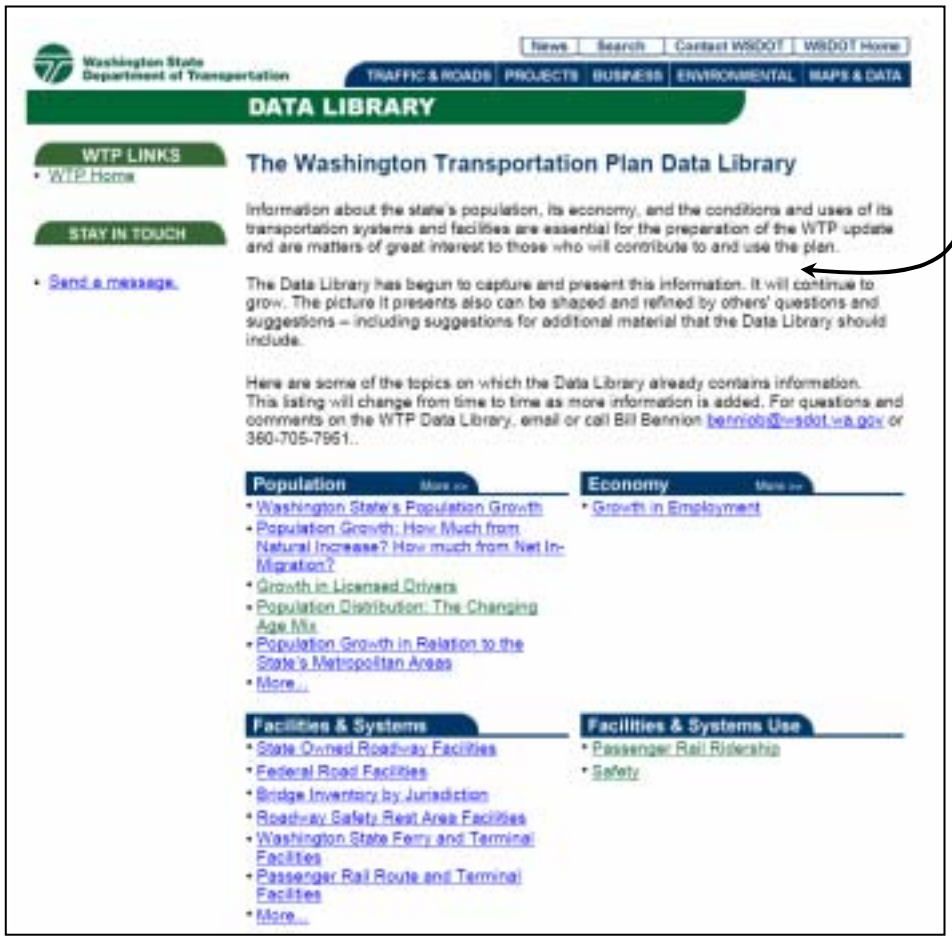

www.wsdot.wa.gov/planning/wtp

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DATA LIBRARY

WTP LINKS
- WTP Home

STAY IN TOUCH
- Send a message.

The Washington Transportation Plan Data Library

Information about the state's population, its economy, and the conditions and uses of its transportation systems and facilities are essential for the preparation of the WTP update and are matters of great interest to those who will contribute to and use the plan.

The Data Library has begun to capture and present this information. It will continue to grow. The picture it presents also can be shaped and refined by others' questions and suggestions – including suggestions for additional material that the Data Library should include.

Here are some of the topics on which the Data Library already contains information. This listing will change from time to time as more information is added. For questions and comments on the WTP Data Library, email or call Bill Bennion bennionb@wsdot.wa.gov or 360-705-7961..

Population
- Washington State's Population Growth
- Population Growth: How Much from Natural Increase? How much from Net In-Migration?
- Growth in Licensed Drivers
- Population Distribution: The Changing Age Mix
- Population Growth in Relation to the State's Metropolitan Areas
- More...

Economy
- Growth in Employment

Facilities & Systems
- State Owned Roadway Facilities
- Federal Road Facilities
- Bridge Inventory by Jurisdiction
- Roadway Safety Rest Area Facilities
- Washington State Ferry and Terminal Facilities
- Passenger Rail Route and Terminal Facilities
- More...

Facilities & Systems Use
- Passenger Rail Ridership
- Safety

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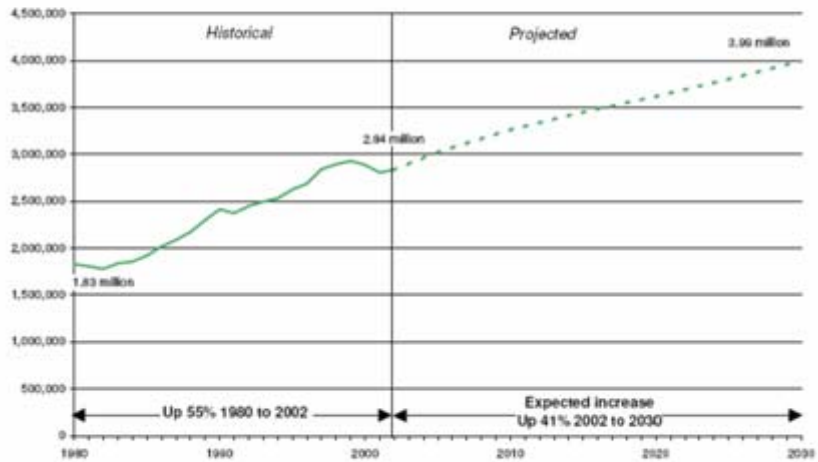
TRANSPORTATION PLAN

WTP Home > Data Library > The State's Economy

Growth in Employment: 1980 to 2002 and 2002 to 2030

From 1980 to 2002, the number of Washington jobs grew from 1.83 million to 2.84 million, an average annual growth rate of 2 percent.

Between 2002 and 2030, 1,158,214 jobs are expected to be added to the Washington economy. Employment in the state is expected to increase at an average annual rate of 1.2 percent, from 2.84 million in 2002 to 3.99 million by 2030.



Source: Table 3-1, **2003 Long Term Economic and Labor Force Forecast for Washington, Office of Financial Management & Employment Security Division**

Most of the projected employment growth will be in trade and services industries. From 2002 to 2020, trade and services are predicted to account for 67 percent of the total non-agricultural job increase in the state.

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TRANSPORTATION PLAN

WTP Home > Data Library > The State's Transportation Facilities and Systems

Roadway Safety Rest Area Facilities

WSDOT owns, operates, and maintains 43 developed safety rest areas (28 on interstate highways and 15 on non-interstate highways). In the safety rest areas, WSDOT manages 85 buildings, 566 acres of land, 30 on-site public drinking water systems, and 37 on-site sewage pre-treatment/treatment systems.

Safety rest areas on the interstate system typically serve one direction of travel such as north-bound (NB) or south-bound (SB). Non-interstate safety rest areas typically serve traffic from both directions and are identified as being multi-directional (MD)

See the Safety Rest Area Inventory table below for more information.

Map of Washington's Safety Rest Areas

Click here to view location information.

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Safety

National Transportation Safety Board's Most Wanted Safety Improvements

Highway Safety

Motor Vehicle Fatalities

Motor Vehicle Fatalities Plus Disabling Injuries

Motor Vehicle Collisions on State Highways

The Cost of Motor Vehicle Collisions to Society

Where do Motor Vehicle Collisions Occur?

Collision Factors

Collision Factor: Age of Drivers

Collision Factor: Driver Errors and Behaviors

Collision Factor: Alcohol Impairment

Collision Factor: Speeding

Collision Factor: Inattentive and Sleepy Drivers

Collision Factor: Not Using Seat Belts

Other Factors

Collison Factor: Motorcycles

Collision Factor: Large Trucks

Collision Factor: Pedestrians

Collision Factor: Bicyclists

Collision Factor: Road Features and Conditions

Collisions in Work Zones

The "Golden Hour"

Intermediate Drivers' License for Young Drivers

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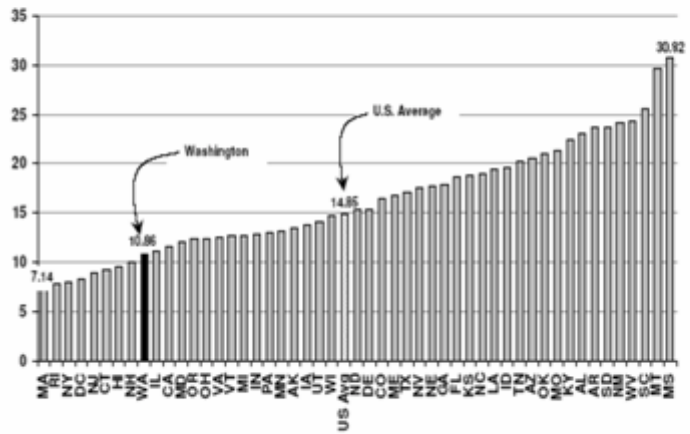
TRANSPORTATION PLAN

WTP Home > Data Library > Use of Transportation Facilities and Systems in the State > Safety

Motor Vehicle Fatalities

In 2002, Washington State ranked ninth in the nation for fewest traffic fatalities in relation to population. That means Washington's average is about 11 traffic fatalities out of every 100,000 people. The national average is about 15 traffic fatalities out of 100,000 people. Compare this to Washington's traffic fatality rate per vehicle miles traveled and the ranking is not much different. Washington is ranked 10th in the nation for traffic fatalities per 100 million vehicle miles traveled.

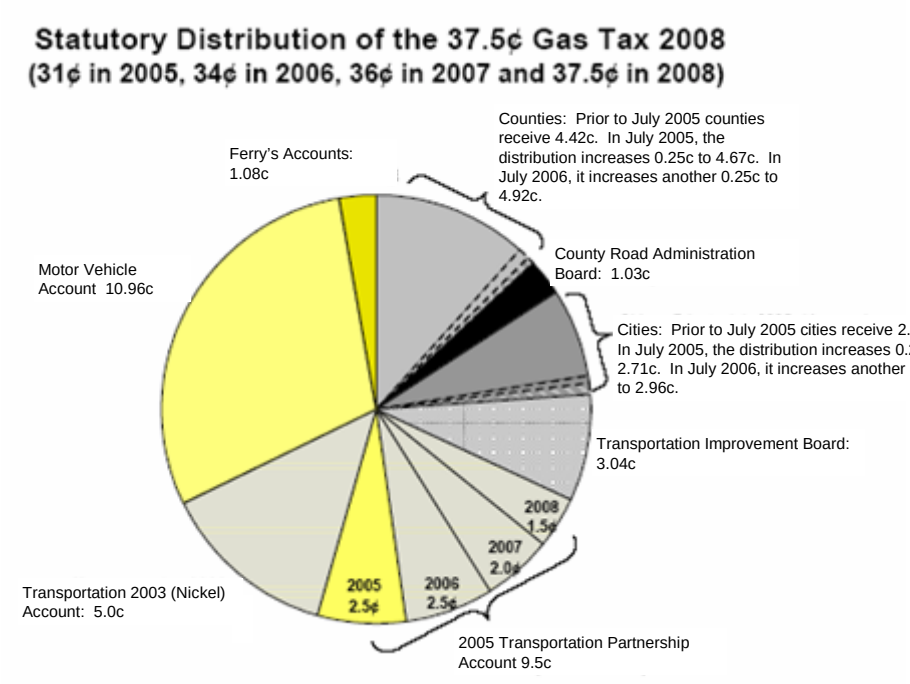
Rate of Fatalities Per Capita in the U.S.
Traffic Fatlities per 100,000 Population in 2002

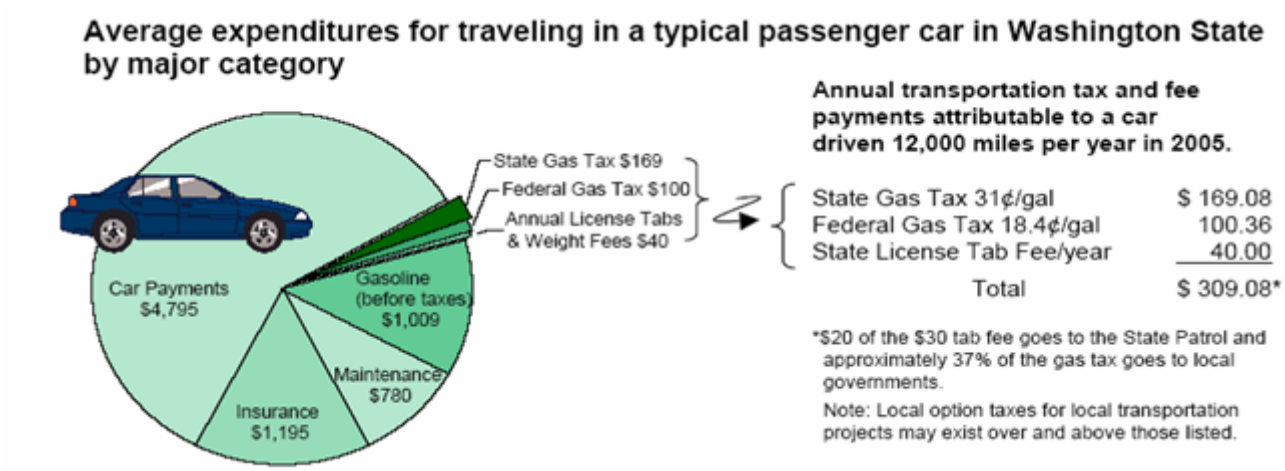


Source: U.S. Department of Transportation; National Highway Traffic Safety Administration - "Traffic Safety Facts: 2002" http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/TSF2002Final.pdf

Source Data: Rate of Fatalities per Capita

Costs of Providing a Transportation System

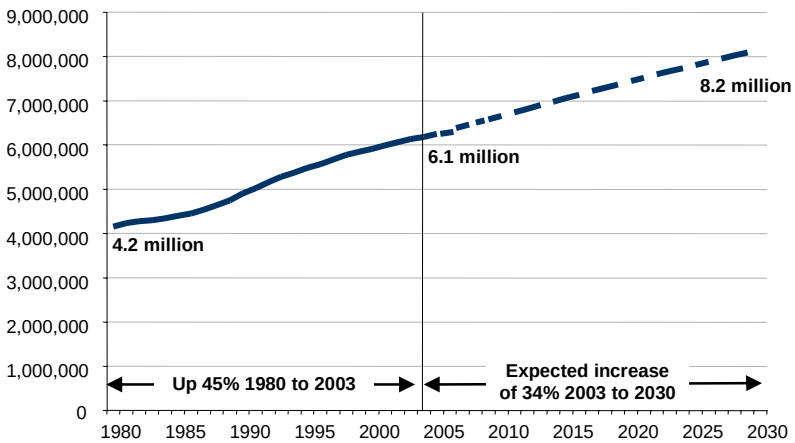




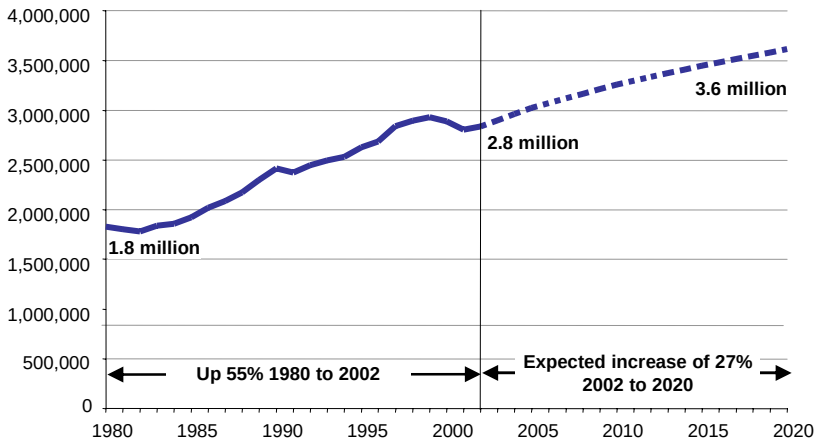
Demands on the Transportation Systems and Services

Demand is up…

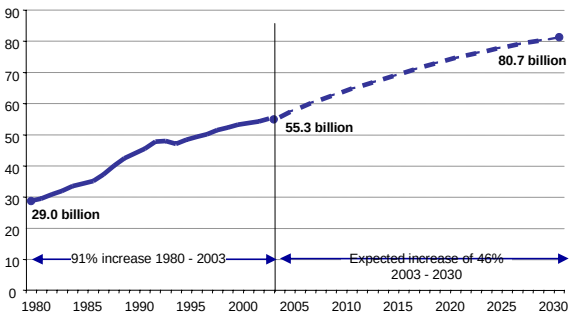
Population Will Continue to Grow



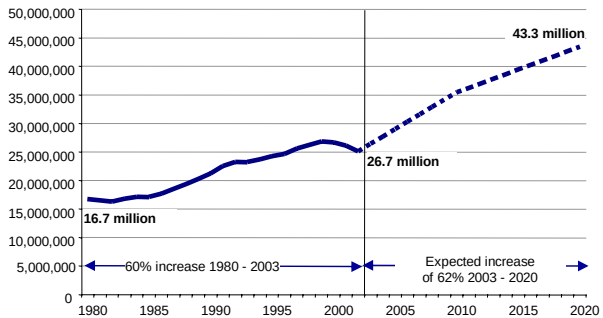
Employment Will Continue to Grow



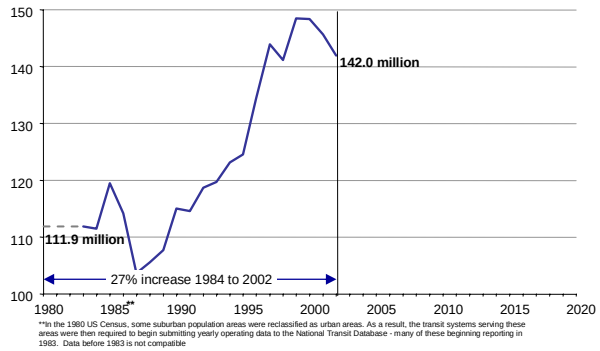
Vehicle Miles Traveled Will Continue to Grow (Miles in billions)



Ferry Ridership Will Continue to Grow

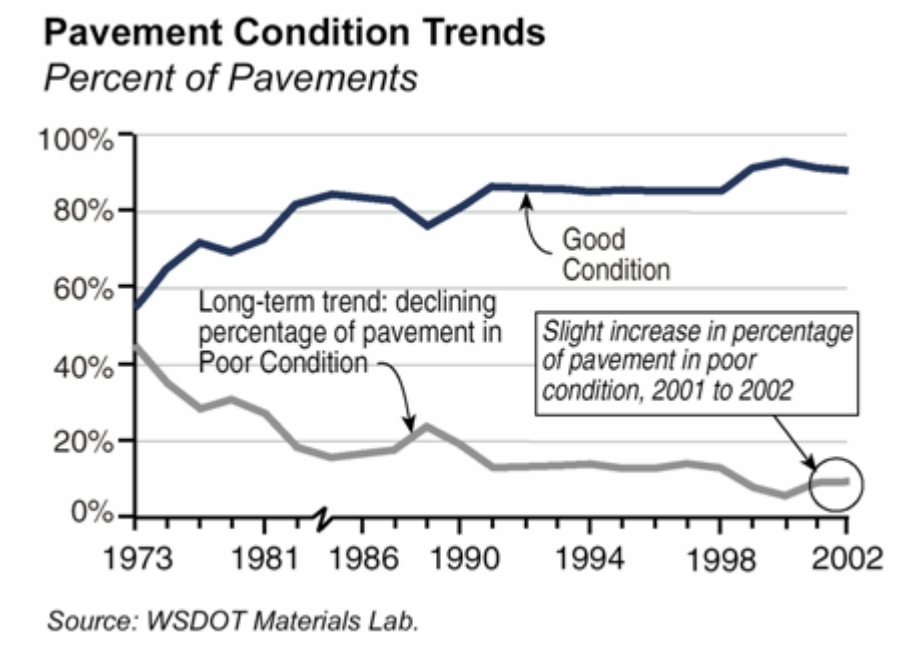


Transit Ridership Will Continue to Grow
(Fixed Urban Passenger Trips displayed)



The System is Aging and Deteriorating…

Even though *asphalt pavement* conditions are improving,***concrete pavement*** conditions on the state's most important highways are in decline and will be expensive and inconvenient to fix.



Source: WSDOT Materials Lab.

2004 Concrete Lane Miles*		
Current Age (Construction or Reconstruction)	**Total Lane Miles**	**Lane Miles Rehabiliated to Date by Dowel Bar Retrofit**
0-10	147.1	0.0
11-20	274.0	0.0
21-30	566.8	35.0
31-40	642.0	322.4
41-50	279.1	58.1
51-60	5.0	0.2
61 or more	66.1	0.0
Total	**1980.0**	**415.7**

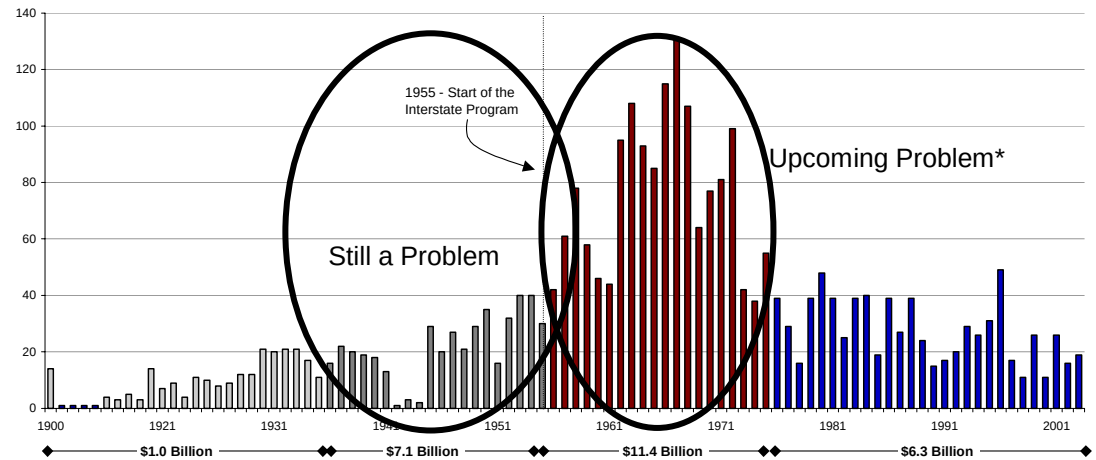
** Does not include 321 lane miles of bridge sections and 112 lane miles of ramps.*

The System is Aging and Deteriorating

Bridges are getting older.

- In the next 20 years, much of the bridge inventory will reach the age of 50 or more years.
- As more of our bridge inventory reaches the age of 50, investment needs for bridge rehabilitation will continue to rise sharply with the most pressing needs being to replace the oldest structures in the system.

Bridge Inventory by Age and Replacement Costs
2004 dollars



*May last longer than assumed life of 50 years

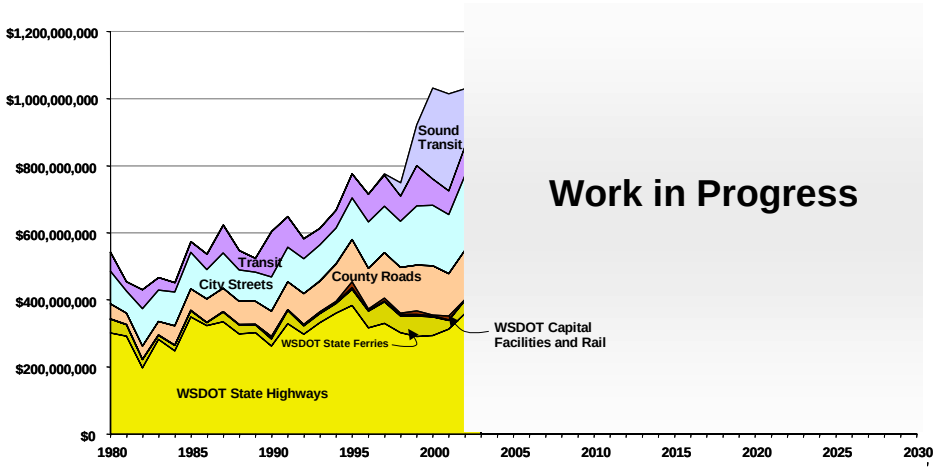
Ferry system assets are getting older.

- Just as with bridges the time is coming when expensive investments in ferry terminals and vessels will need to be made.
- Of our 28 ferry boats, 21 are more than 20 years old and six are 50 years or older.

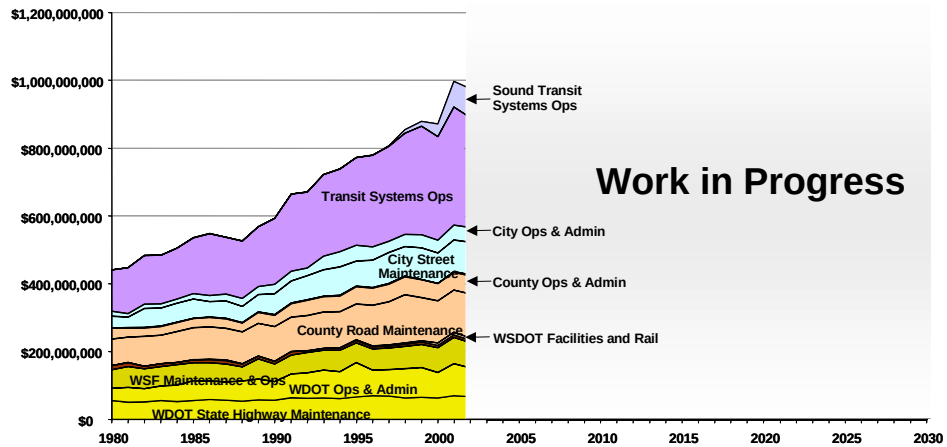
Class	Name	Year Constructed	Age
Jumbo Mark II	Tacoma	1997	7
	Wenatchee	1998	6
	Puyallup	1998	6
Jumbo	Spokane	1972	32
	Walla Walla	1972	32
Super	Hyak	1967	37
	Kaleetan	1967	37
	Yakima	1967	37
	Elwah	1967	37
Issaquah 130	Issaquah	1979	25
	Kitsap	1980	24
	Kittitas	1980	24
	Cathlamet	1981	23
	Chelan	1981	23
Issaquah	Sealth	1982	22
Evergreen State	Evergreen State	1954	50
	Klahowya	1958	46
	Tillikum	1959	45
Steel Electric	Quinault	1927	77
	Illahee	1927	77
	Nisqually	1927	77
	Klickitat	1927	77
Miscellaneous	Rhododendron	1947	57
	Hiyu	1967	37
Passenger-Only	Skagit	1989	15
	Kalama	1989	15
Chinook	Chinook	1998	6
	Snohomish	1999	6

Funding: What does the Future Look Like?

Capital Investment for Transportation by WSDOT, Counties, Cities, & Transit Agencies 1980 – 2002 Historical Data - (1980 dollars)



Operating Expenditures for Transportation by WSDOT, Counties, Cities, & Transit Agencies 1980 – 2002 Historical Data - (1980 dollars)

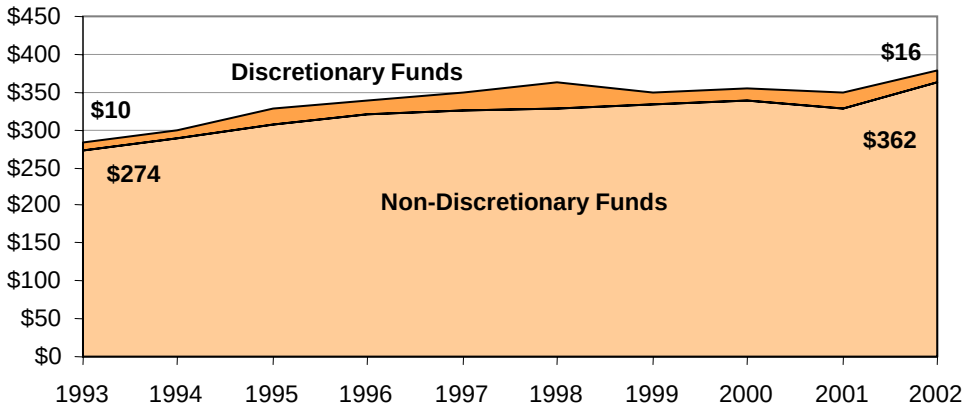


Note:Transportation funds include associated bond proceeds but are net of debt service expenditures. These charts also do not include policing revenues or expenditures.

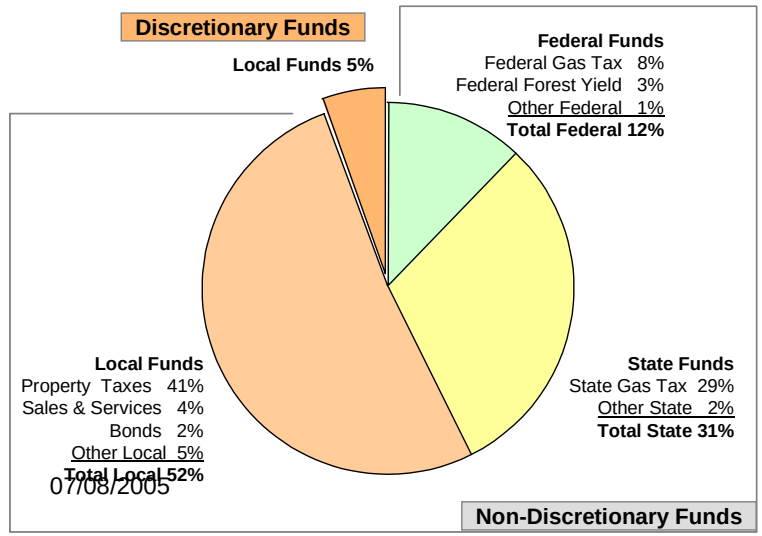
How Have County Roads Been Funded?

A historical look at sources funds

Counties - Statewide Totals
Discretionary & Non-Discretionary Funds
Millions of 1980 Dollars

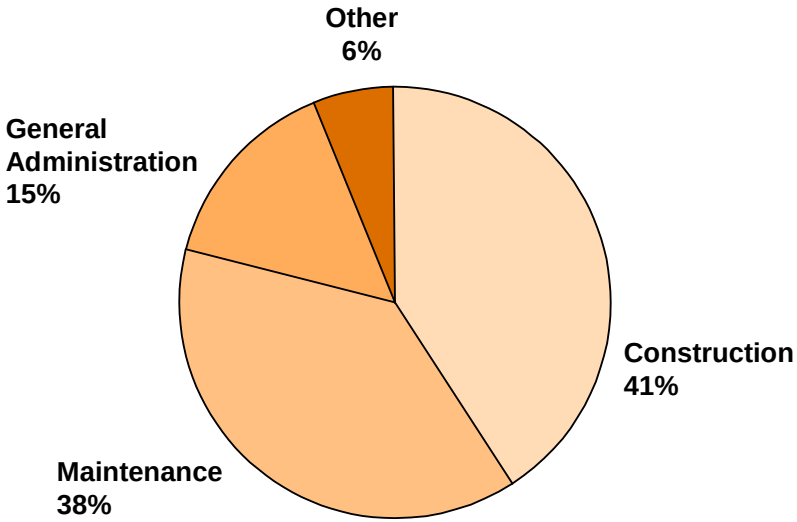


Counties - Statewide 10-Year Totals
Discretionary & Non-Discretionary Funds
Percent of Total



A historical look at uses funds

Counties - Statewide 10-Year Totals
Uses of Funds
Percent of Total

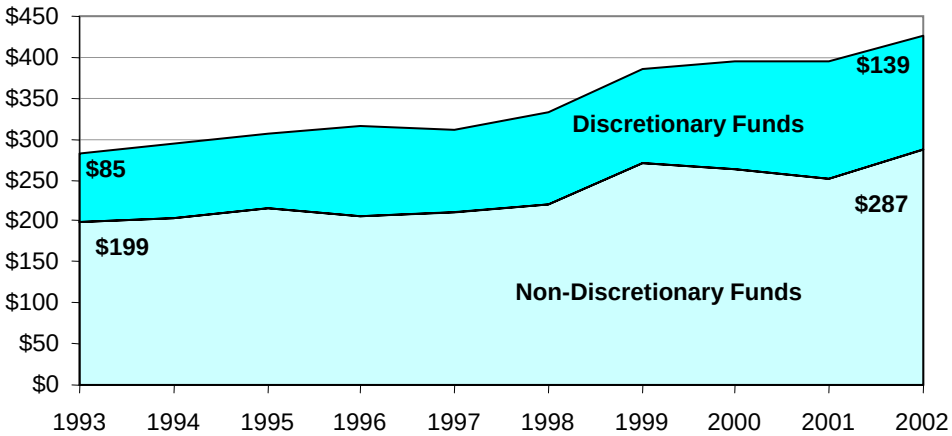


Note:Transportation funds include associated bond proceeds but are net of debt service expenditures. These charts also do not include policing revenues or expenditures.

How Have City Streets Been Funded?

A historical look at sources funds

Cities - Statewide Totals
Discretionary & Non-Discretionary Funds
Millions of 1980 Dollars



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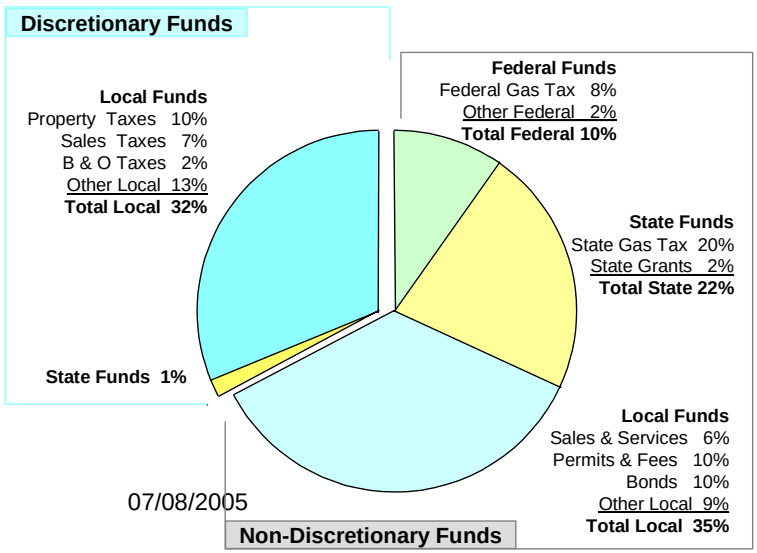

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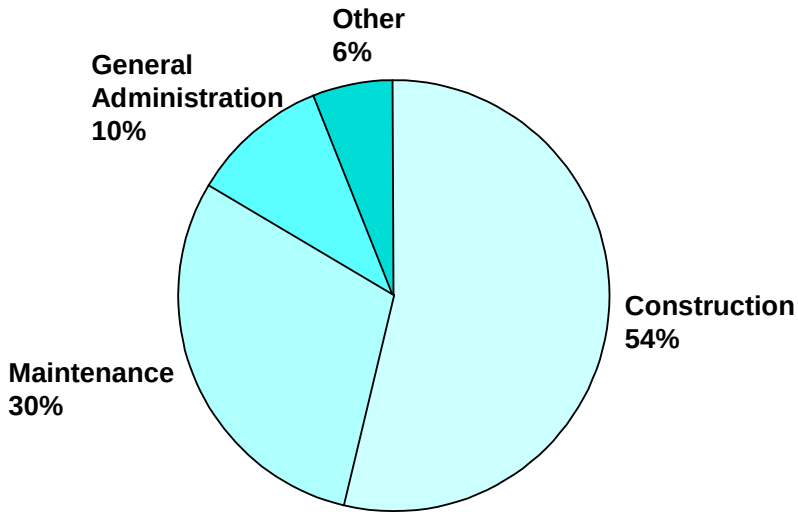

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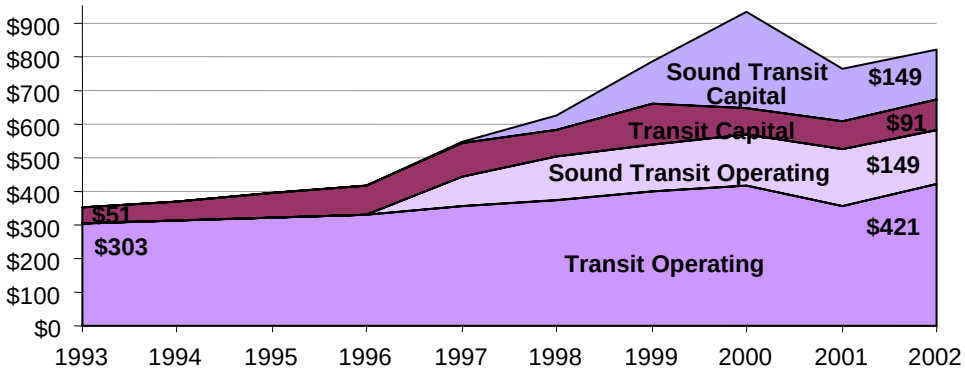
These charts also do not include policing revenues or expenditures.

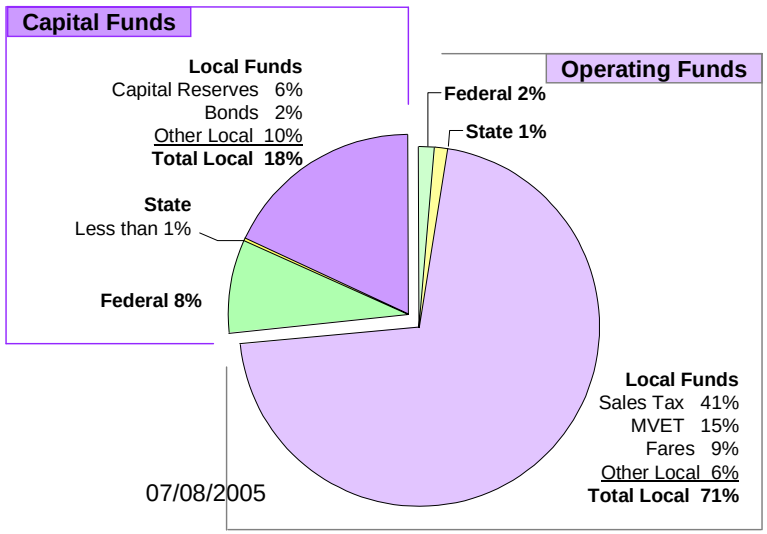
How Has Transit Been Funded?

A historical look at sources funds

Transit - Statewide Totals
Capital & Operating Funds
Millions of 1980 Dollars



Transit - Statewide Totals
Capital & Operating Funds
Percent of Total



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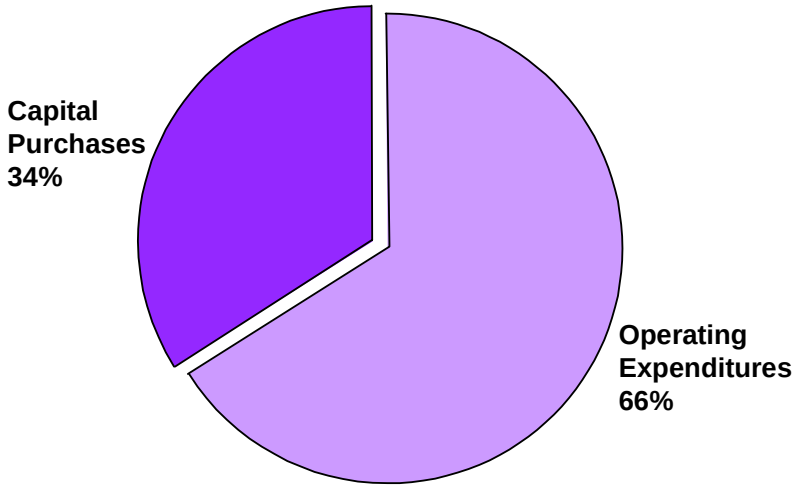

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So how should we approach the problem of making choices and setting priorities?

Capital investment in preservation and current investment in maintenance and operations are paramount issues.

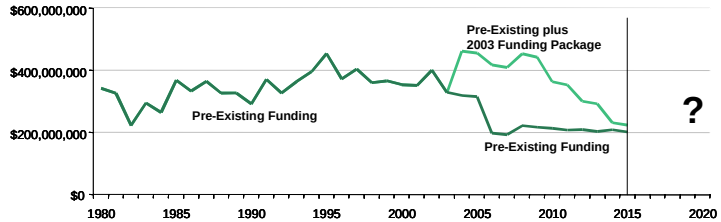
Also:

- The ability to address “New Capacity” for congestion relief will be an issue.
- Targeted safety investments that provide the highest benefit will also need to be made.
- There are many other potential priorities in the area of rural roads and freight mobility - to name a few.

Reality Intrudes

To put the funding potential in perspective, several scenarios were developed. The bottom line: even with an aggressive state funding scenario, priorities will have to be set.

Over the Next Decade WSDOT Funding is Declining Even With the Last Funding Package (in 1980 constant dollars)



How much additional funding could be raised over the next decade?

Dollars in millions

Three scenarios, 2 options each.	Option A				Option B			
	Local Share	State Share		Total	Local Share	State Share		Total
	50%	*50%*			*25%*	*75%*		
		20% Maintenance	80% WSDOT Capital*			20% Maintenance	80% WSDOT Capital*	
Scenario 1: **1¢ gas tax increase each year for the next 10 years**	$993	$199	$1,835	$3,027	$497	$298	$2,722	$3,517
Scenario 2: **10¢ gas tax increase beginning July 1, 2005**	$1,781	$356	$2,526	$4,663	$890	$534	$3,790	$5,214
Scenario 3: **10¢ gas tax increase beginning July 1, 2005, plus another 10¢ increase July 1, 2011**	$2,675	$535	$4,344	$7,554	$1,337	$802	$6,577	$8,716

**Amounts shown for WSDOT Capital Investment include assumptions for the sale of bonds using the available revenue stream. The funding level can vary depending on the timing of expenditures and the resulting bond sales needed, as well as from financing assumpitons including interest rates and debt service coverage requirements.*

Strategic Issues for this Update

- ✓ System Preservation
- ✓ Safety
- ✓ Transportation Access
- ✓ Strong Economy & Good Jobs
- ✓ Moving Freight
- ✓ Health & the Environment
- ✓ System Efficiencies
- ✓ Bottlenecks & Chokepoints
- ✓ Building Future Visions

System Preservation

What are we finding?

On State Highway Pavements: WSDOT has made progress on asphalt and chip seal pavements, improving conditions and achieving lowest life cycle cost investment. Concrete pavements are an emerging need: they are disproportionately represented in poor pavement miles. The pro forma 10 year budget is adequate to cover asphalt and chip seal repaving needs, but falls far short of funding concrete rehabilitation needs (could represent over $1 billion shortfall)

On State Highway Bridges: WSDOT has made good progress on bridge rehabilitation, but aging bridges represent a growing need. WSDOT's pro forma 10 year budget has shortfalls: bridge painting ($50 million); bridge deck preservation ($23 million); and bridge replacement ($50 million +inflation). In addition, replacement of the Alaskan Way Viaduct and SR 520 floating bridge are unfunded and represent a many billion $ shortfall. No funding is identified for modernizing bridges with width and geometry deficiencies, which could cost $1.5 billion.

Other State Highway needs include shortfalls in unstable slope work ($25 million); rest area preservation ($15 million); and potentially large shortfalls in preserving drainage structures and electrical systems, pending complete inventories.

On Local Roadways: Local governments face large shortfalls in preserving their pavements and bridges, with local transportation funding being squeezed by reductions, growing costs, and expansion needs. Consistent data on preservation needs of local roadways, especially for cities, is lacking.

On Washington State Ferries: The current 10 year budget pro forma shows the WSF meeting targets for both vessel and terminal preservation, including the replacement of 4 1927 vessels. Further vessel replacement beyond the 10 year period is an outstanding and unfunded issue.

On General Aviation Airports: A shortfall exists in paving, lighting, and navigation aids. An inventory is being updated.

On Public Transit Systems: An inventory is being developed on transit asset preservation needs. Issues include funding stability for bus fleet replacement strategies; increasing costs for preservation of service levels; park and ride lot preservation needs; and growing demand response operating needs are competing with other transit priorities.

On Railroads: Shortline rail tracks are facing large rehabilitation needs,and may be at least partly unfunded.

Emerging Directions

• Asset preservation has emerged as a major issue for the WTP: "Pay me now, or pay me much more later"

• Big ticket preservation needs include replacement of the Alaskan Way Viaduct, the SR 520 floating bridge, and concrete interstate pavements. In addition, regular state highway preservation programs (such as bridge painting, bridge deck preservation, bridge replacement, drainage systems, electrical systems, and others) need to be augmented.

• Local roadway preservation shortfalls are affecting system performance and need to be addressed.

• Stable funding for transit and ferries is needed to enable fleet and terminal asset management strategies to work. An approach for prioritizing general aviation pavement rehabilitation needs is needed.

Safety

What are we finding?

- Roadways continue to be the biggest safety concern: while fatality rates continue to fall, more than 600 people are killed annually on Washington roadways, with many more suffering disabling injuries.
- The societal cost of motor vehicle collisions for all roadways (state, county, city, tribal, and federal) is estimated at $5.6 billion annually. Although fatal and disabling injury collisions make up only 2.5% of the total number of collisions, they account for 54% of the total societal costs.
- Rural roads (state, county, and federal) have the highest accident rates and are outstanding problems.
- Young, inexperienced drivers (16 – 20 years old) are the age group with the highest rate of fatal collisions. On the other end of the age spectrum, the risk of being involved in a fatal collision begins to grow in the 71+ age group. As the state's population ages, this will be a continuing concern.
- 93% seatbelt use in Washington, but half of all fatalities are of unbelted drivers or passengers.
- The top three contributors in fatal accidents are:
    - Lane errors – 43% (This is a broad category that includes, improper lane changes, merging and exiting, leaving the roadway, crossing into the path of on-coming traffic, etc.)
    - Alcohol – 30 %
    - Speeding – 24%
- The number of pedestrian deaths (12% of all fatalities in 2002) remains disproportionate to the frequency they are involved in roadway collisions (1.4% of all roadway collisions). 40% of pedestrian fatalities involve impaired pedestrians, and a large number of pedestrian accidents take place close to transit stops. Bicycle crashes are of concern because they are more often severe. The rate of all collisions involving motorcycles is only 1.4%, however, the percent of fatal and disabling collisions involving motorcycles is 12%.
- The biggest safety concern on rail is trespassers being hit by trains.
- General aviation safety problems include pilot error due partly to inadequate weather information

Emerging Directions:

- Behavioral approaches will be a significant part of the strategy to address impaired driving, seat belt use, speeding, aggressive driving, and other contributing driver behaviors. WSDOT and the Traffic Safety Commission are working together to evaluate the effectiveness of potential behavioral countermeasures.
- Roadway Environment—safety conditions on rural two lane roadways can and should be addressed – strategies such as increased enforcement, centerline and edge rumble-strips, and improved shoulders and roadsides are being evaluated. Also, median cable barriers and rumble strips on Interstates are proving to be cost-effective solutions.
- Pedestrians, bicyclists, and motorcyclists are disproportionately represented in fatality rates and need to be addressed in the safety strategy.
- Stepped up efforts to prevent railroad trespassing, such as Operation Lifesaver, are needed.
- Improved weather information access at general aviation airports will help pilots make good flight decisions.
- Better understanding of data, e.g., separated by county, should help target safety efforts where they will have the most effect.

The Demand-Capacity Imbalance*
Four Interconnected Issues

Nine WTP Issues

- ✓ System Preservation
- ✓ Safety
- ✓ Transportation Access
- ✓ **System Efficiencies**
- ✓ **Bottlenecks and Chokepoints**
- ✓ **Moving Freight**
- ✓ **Building Future Visions**
- ✓ Strong Economy & Good Jobs
- ✓ Health & the Environment

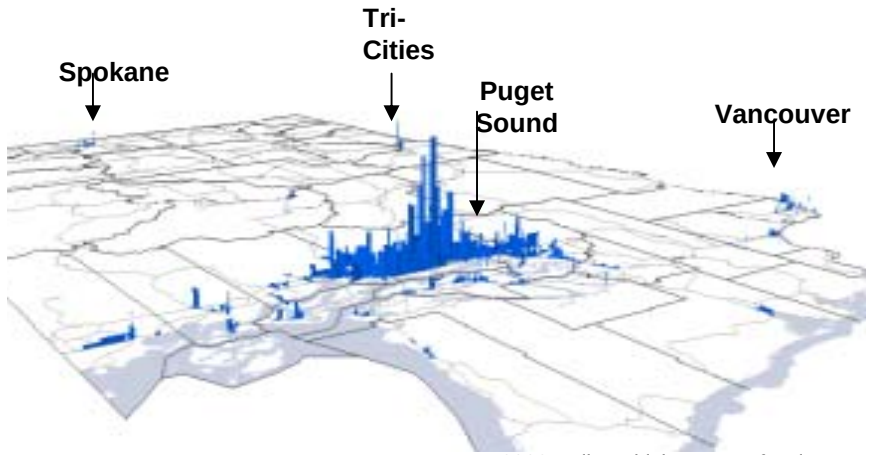
Achieving Better Balance

- **Maintaining flow**
- **Maximizing throughput**
- **Improving productivity**

*A condition when peak period demand exceeds capacity

What are we finding related to demand/capacity?

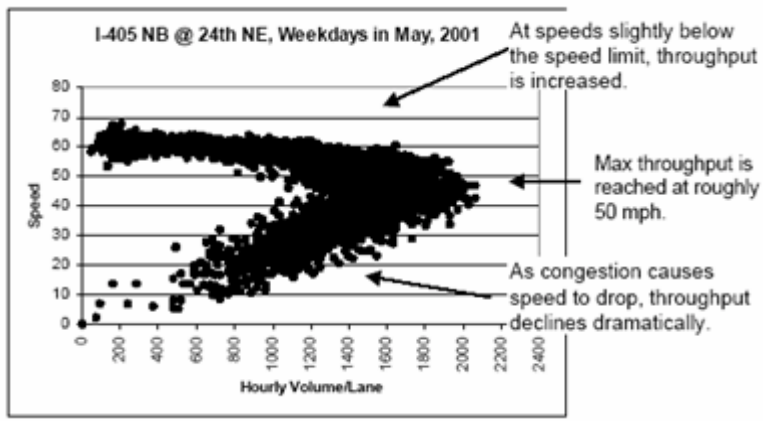
- Demand is growing, and the demand/capacity imbalance will continue to grow in the future, leading to more congestion.
- Congestion occurs mostly in the urban areas, especially Puget Sound, Vancouver and Spokane. (92% of all delay on highways occurs in these areas.)

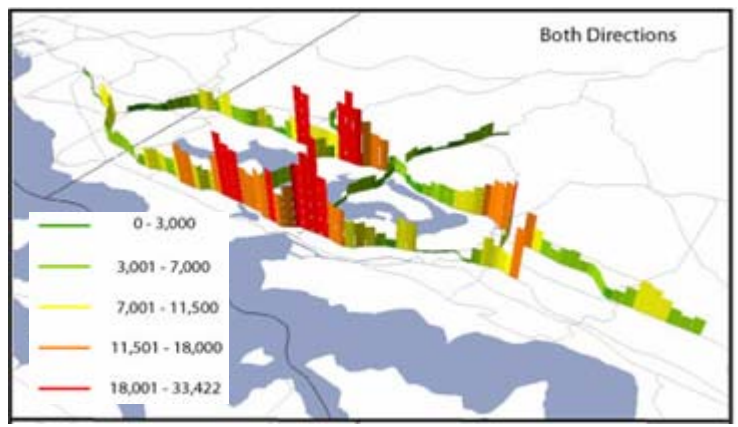


2002 Daily Vehicle Hours of Delay Per Lane Mile

- Congestion causes lost productivity: Maximum freeway throughput of about 2000 vehicles per hour occurs at speeds of 45-50 mph. Throughput drops dramatically when traffic volumes force speeds to drop below 50 mph. The capacity of the roadway actually decreases (as much as half) with congestion-induced reduction in speed.

System Efficiency Example





Efficiency Loss: Vehicle Throughput Reduction
Major Seattle Area Freeways

Flow, Throughput and Productivity
Emerging Directions

System Efficiencies:

- Improvements such as ramp metering, incident response, HOV lanes, and others have been successful at improving flow on the system.
- Strategies such as commute trip reduction programs and transit oriented development provide options.

Bottlenecks and Chokepoints:

- There are locations on the system where system geometry and traffic patterns contribute to congestion and reduce throughput capacity.
- Targeted capital investments at these locations would be less expensive than full corridor build-outs, but could deliver significant delay savings and restored productivity.
- Corridor completion in certain locations (SR395, SR509, SR167, SR18, SR704, and High Occupancy Vehicle (HOV) Core routes) are higher cost ways to address the demand-capacity imbalance.

Building Future Visions:

- New or major corridor expansion will need to be considered in the future.

System Efficiencies—What are we finding?

Basic maintenance and operations are the cornerstone of keeping the system moving.

As congestion grows, more sophisticated technologies are needed to maintain flow:

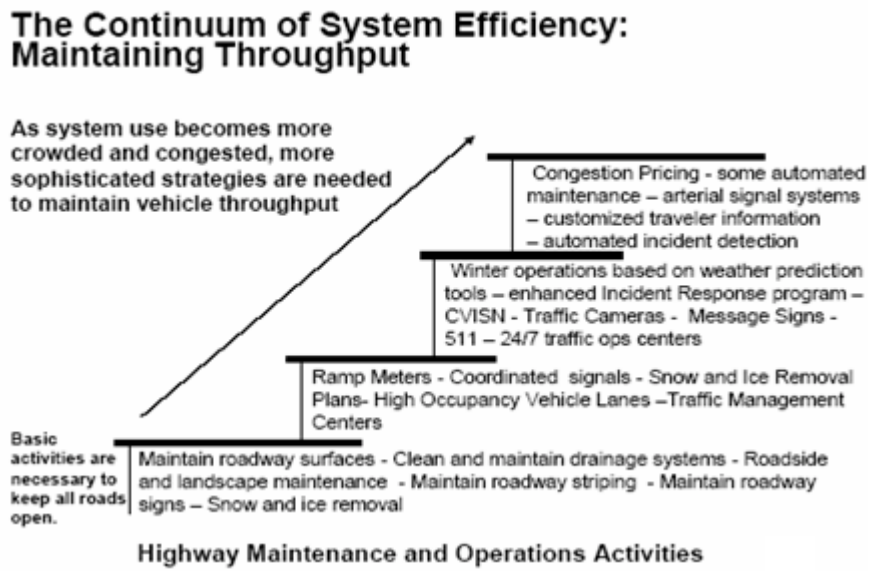
- **Intelligent transportation system (ITS) technologies**
- **Incident response**
- **Signal optimization**
- **Truck operations**
- **Managed lanes**
- **Pricing**

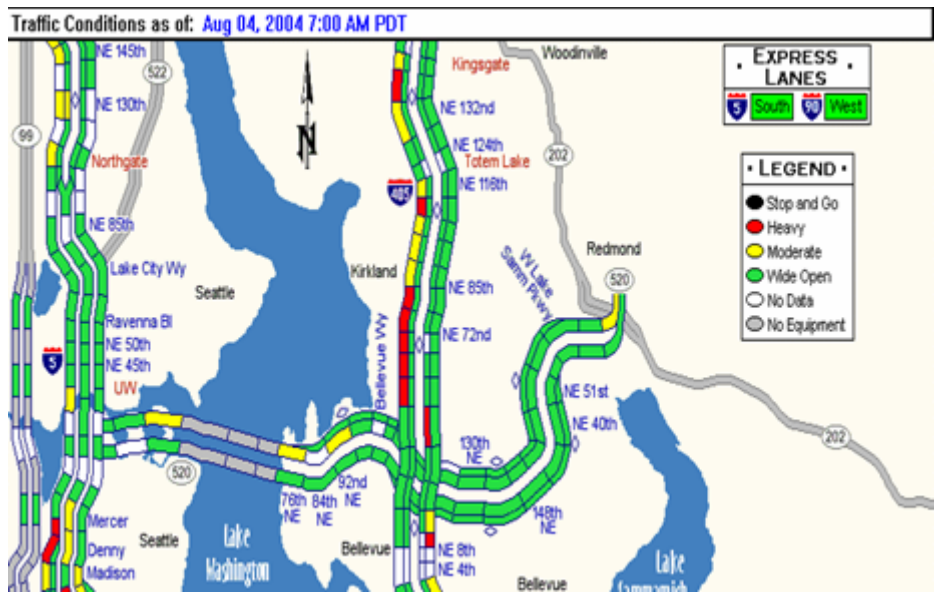
Improving public transit operations

- **System operating configuration**
- **Communications to manage the fleet and inform customers**
- **HOV lane strategies**
- **Park and ride lots**
- **Travel Conservation: Reducing or Redirecting Demand**
- **Transit-supportive**
- **Land use strategies**

Issues facing Washington State Ferries operations

- **Congestion and peaking in the system**
- **Trip reliability**
- **Intermodal connections**





System Efficiencies—Emerging Directions:

System efficiency is about aligning transportation system performance with customer expectations and getting the highest performance possible out of the existing system – this applies to all modes.

On roadways, including transit, throughput is a key measure of system efficiency.

- Basic maintenance and operations are essential to keep the system open and operating.
- As traffic grows, increasingly sophisticated management techniques are needed to maintain flow.
- Information technology will allow the next generation of management techniques.
- Advance communication will permit real-time information for travelers.
- In-vehicle ITS devices (such as On-Star) will be the next step, sharing weather, safety, and transportation system data with drivers, system providers, and first responders.
- Closer integration of modes (highway and transit) will need to address real-time system coordination.

The focus has been on system efficiency measures – the next frontier is point-specific applications to improve flow at specific chokepoints (such as truck performance at specific on-ramps).

System pricing is emerging as one of the primary options to effectively maintain flow, because price allows the ultimate flexibility in matching roadway capacity to traffic demands.

Operational approaches should be viewed as a part of a continuum and an integral part of our investment program: a commitment to maintain and operate the system; management techniques to maximize use of the system, and capital investment to expand the system where needed.

Bottlenecks & Chokepoints

What are we finding?

Demand is growing, and the demand/capacity imbalance will continue to grow in the future.

Congestion occurs mostly in the urban areas, especially Puget Sound, Vancouver and Spokane. (92% of all delay on highways occurs in these areas.)

Congestion affects efficiency of the system: Maximum freeway throughput of about 2000 vehicles per hour occurs at speeds of 45-50 mph. Throughput drops dramatically when traffic volumes force speeds to drop below 50 mph. The capacity of the roadway actually decreases (as much as half) with congestion-induced reduction in speed.

There are locations on the system where system geometry and traffic patterns contribute to congestion and the reduction of throughput capacity. These locations, known as bottlenecks and chokepoints, provide an opportunity to restore lost capacity to the system.

Bottlenecks and chokepoints are not always locations with measured congestion-related delays: roadway geometry may impede traffic flow; weather and other events (spring thaw, flooding, avalanches) may affects passability of a roadway.

Emerging Directions

Targeted capital investments at bottlenecks and chokepoints cost less than full corridor projects, and can result in a recognizable reduction in delay and improved flow for the traveler – they represent the biggest bang for the “short” buck to be invested in capacity expansion solutions. New analysis techniques are needed to identify these locations, and to develop and prioritize appropriate solutions

Bottleneck and Chokepoint Investment options could be developed to improve travel for commuters, freight, interregional movement, recreation and event access

Moving Freight

What are we finding?

Freight needs have been identified in three areas:

- Global trade throughput – freight that flows through Washington
  - Port related trade is growing, raising concerns about both highway capacity, railroad capacity, and the ability of port connector roadways to handle the projected volumes

- The needs of Washington's producers & manufacturers
  - .Washington manufacturing represents $88 billion and Washington agriculture represents $5.6 billion in economic activity per year – freight movement is essential to receive supplies and to move products to markets
  - These needs vary by region

- The retail and wholesale distribution system
  - Represents up to 80% of all truck travel
  - Critical supply chains for everything we consume, including gas, groceries and garbage.

Emerging Directions

- Addressing rail bottlenecks: East/West mainline capacity; port access in Vancouver, Kalama, Tacoma,and Seattle; border crossings
- Reducing the productivity loss due to roadway congestion: urban area bottleneck and chokepoint solutions; I-90 Snoqualmie Pass delay reductions (capacity and weather); Canada/U.S. border truck crossings
- Maintaining the Columbia/Lower Snake River System as a transportation option: dredging and lock maintenance
- Developing a multi-county core all-weather road system (state and county roads) to minimize the economic impacts of thaw related closures
- Improving air cargo ground capacity and access to Sea-Tac International and King County airports
- Determining the proper state role in shortline rail track preservation

Building Future Visions—What are we finding?

Rapidly evolving technology holds some nearer term promise:

- **Smart vehicles and roads – interactive systems for variable cruise control and collision avoidance, among others, improve efficiency and safety.**

Pricing strategies to manage flow and increase traditional transportation funding, especially in congested corridors. Technology is now available to allow electronic toll collection – no toll booths.

New fuels from non-petroleum energy sources, such as biodiesel and hydrogen, should improve air quality. Funding issues need to be resolved.

Prototype fuel cell vehicle

Building Future Visions—Emerging Directions:

- In order to build the new systems and capacity expansions needed to support growth, new financing strategies will be needed. Regional approaches, such as the Regional Transportation Investment District (RTID) of Puget Sound, show promise if voters will support regional funding sources to augment state transportation funding.
- Pricing approaches also show promise to supplement traditional transportation funding, especially in congested corridors.
- As ITS technologies continue to be developed, such as smart vehicles and smart roads, Washington needs to be on the forefront of adapting the transportation system to make sure that the benefits of these innovations are accessible to drivers, including commercial drivers who make their living on the roads.
- The anticipated shift from petroleum-based fuels to alternative fuels requires Washington to adapt the current transportation funding system. Innovative and fair strategies for meeting future system needs must be devised and implemented.

Health & The Environment

What are we finding out?

Air Quality: Air quality is improving: concerns remain with air toxics, inhalable soot ($PM_{2.5}$), and other components of diesel exhaust. Carbon dioxide, implicated in global warming, is a significant transportation emission. Strategies to reduce carbon dioxide include reducing VMT and improving vehicle technologies.

Active Living and Healthy Communities: Washington residents are increasingly overweight, and automobile dependency is implicated along with diet and other choices. Access to facilities such as sidewalks and bike paths, and transit-friendly land use patterns, increase the frequency of physical activity.

Water Quality – Stormwater: Concerns are both in quality (preventing pollution from entering water bodies)and quantity of runoff, which affects flooding, erosion, and stream habitat. Watershed approaches provide a

Protecting and Connecting Habitat: Washington State has significant natural biodiversity that is highly valued by the citizens of the state. Roads affect direct loss of habitat, collisions with vehicles, fish passage, the movement of wildlife across landscapes, and the quality of remaining habitat

Operations and Maintenance: Environmental Management System and compliance review will help WSDOT ensure best environmental practices.

Noise: Barriers remain an effective strategy, but retrofit program is largely unfunded.

Sprawl: Transportation's role in "sprawl" is a matter of debate and discussion: this must be resolved at the regional planning table, rather than on a project by project basis.

Emerging directions

- Meeting environmental priorities:
  - –Help shape the state's response to calls for reductions in greenhouse gas emissions
  - –Invest in watershed-based tools to better address stormwater and wetlands needs
  - –Actively address habitat connections across transportation corridors
- Defining an appropriate transportation role in the area of active living
- Recommending a systems approach for addressing cumulative effects of transportation projects and induced growth issues

Transportation Access

What are we finding?

Persons with special transportation needs (those without car access) fall into four broad groups: the elderly, people with disabilities, children, and people with low incomes. It is difficult to determine how many people in these groups need specialized transportation services, but the demand is growing.

The elderly are a growing share of the population and they are driving more and longer. The elderly are "aging in place", increasingly living in suburban areas where driving is essential, and public transit service is difficult and expensive to provide. The growing "old" elderly (85+) will increase the demand for demand-response public transportation. The growing number of older drivers will require special roadway safety emphases (such as signing).

Public transit agency spending represents a majority of funding for access services, but many, especially rural, areas of the state do not have public transit services. The continued loss of intercity bus services has further contributed to a sense of rural isolation. A large number of both non-profit and for profit groups provide access services in all areas of the state. Many of these services rely on volunteers, and funding in precarious. Demand response services are expensive to provide, and are taking an increasing share of limited transit agency funding. With current funding, transit agencies face the dilemma of trading-off between demand response service and fixed route service.

Efforts to coordinate these services are ongoing through organized broker programs, and the efforts of the Agency Council on Coordinated Transportation.

Emerging directions:

- Comprehensive strategies are needed to address the transportation issues of the growing elderly population, and of increasing rural isolation.
- Funding and service levels for demand response service by both transit agencies and other providers needs to be addressed.
- Continuing focus on better coordination between services is needed to minimize duplication and make the most of available revenue.

Strong Economy & Good Jobs—What are we finding?

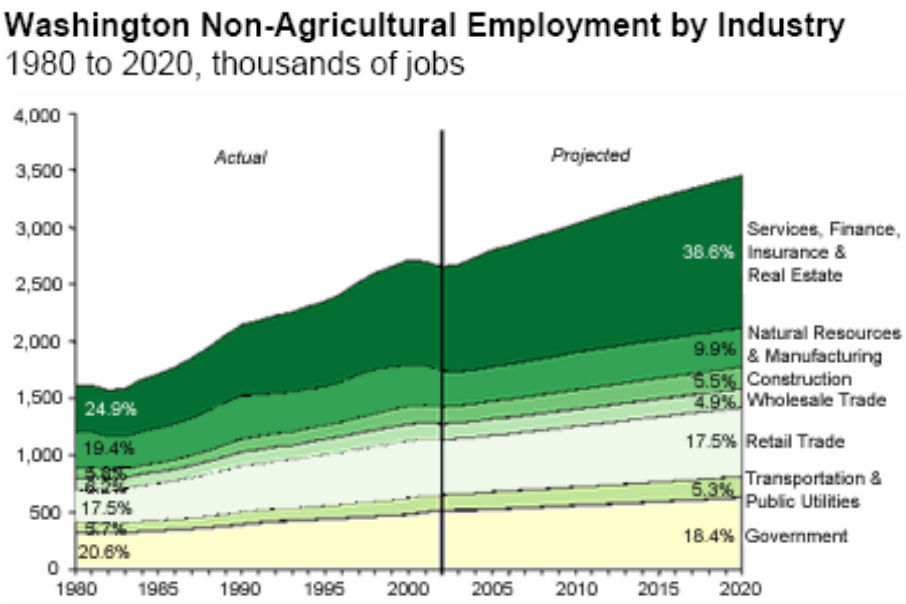
Washington's economy is shifting to become more services based, but manufacturing is still important.

Research shows a strong link between transportation and economic development. Benefits of transportation investment include:

- **User Benefits (delay savings, safety, operating costs, etc.)**
- **Jobs from project construction, and multiplier**
- **Economic productivity increases that expand the state economy**
- **Development in local areas (improved access/land development/tourism)**

Transportation is necessary for economic development, but not sufficient to ensure economic development at specific locations. We should be cautious about speculative investments.

What are the transportation needs of economic clusters?



Washington's Economic Clusters

Ranked by Gross Business Income 2000		Ranked by Employment 2000	
Aerospace	**$37.81 billion**	**Tourism**	**261,625**
Health Care	**$13.2 billion**	**Health Care**	**216,618**
Tourism	**$10.2 billion**	**Aerospace**	**88,079**
Food Processing	$7.6 billion	Software	70,167
Metal Working	$7.3 billion	International Trade	50,065
Software	$6.6 billion	Food Processing	49,757
Wood Products	$6.4 billion	Metal Working	44,692
International Trade	$3.8 billion	Electronics/Computers	34,081
Electronics/Computers	$3.7 billion	Wood Products	26,085
Biotechnology	$2.0 billion	Biotechnology	14,534
Aluminum	$1.9 billion	Aluminum	6,193
Concrete/Cement/Brick	$300 million	Concrete/Cement/Brick	3,535
Non-Ferrous Metals	$200 million	Non-Ferrous Metals	1,402

Strong Economy & Good Jobs—Emerging Directions:

- Transportation infrastructure is a necessary factor for economic development, but not sufficient to ensure economic development. Other factors are important and may overshadow transportation investment.
- The Transportation Commission defines economic development as: economic activities that result in development or retention of income-generative industries (those industries that raise per capita income of the state). Transportation policy should continue to focus economic development transportation projects on supporting "sure bets" rather than speculative development and should be aimed at supporting generative industries not development that just redistributes personal income from one locality to another (such as retail).
- Targeted transportation economic development projects should focus on retaining existing jobs or probable new jobs to help ensure success.
- WSDOT should continue to work closely with the Washington State Department of Community, Trade and Economic Development and the State Economic Development Commission to evaluate the transportation needs of industry clusters to support the overall state economic development direction as the Statewide Economic Vitality Plan is updated.

What becomes of these Emerging Directions?

- For each issue, we began to identify potential Areas of Targeted Investment that would used refined and developed to make up a set of proposals in a 10-year investment package.
- The Areas of Targeted Investment would be the basis for Commission discussions on prioritization, including possible sources of funding matched to each area.
- This prioritization phase is intended to result in a “constrained” investment proposal that will be recommended to the Legislature in 2007.

- In the meantime, 2005 Legislature passes a significant capital funding package for the state, cities, counties, and transit sourced by a 9.5-cent gas tax increase, new weight fees, license and other fees projected to raise about $8.5 billion over 16 years.
- Reality Check: compare areas of targeted investment to funded projects and programs, noting “hits and misses”—change of focus for the WTP.
- In many ways, legislative action made our planning lives easier—what’s left to focus on?
- The “misses,” some of which are significant:
  - Increased maintenance & operations of added infrastructure, concrete pavement replacement, city & county preservation, high accident locations in larger cities, county 2-lane safety, county core all-weather roads, rural intercity bus service, stormwater inventory and retrofit to name a few.
  - Several policy issues to resolve: airport land use compatibility, tribal transportation planning support, alternative fuels funding strategy, and others.

And our budget and capacity for additional work is committed for the next 16 years!

Stay tuned:

http://www.wsdot.wa.gov/planning/wtp/

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